

U.S. Serial No. 10/597,169

Response dated: April 5, 2012

Response to Office Action dated: January 5, 2012

**CLAIM AMENDMENT**

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (Currently Amended): A polymer composition comprising

- a) a multimodal high density polyethylene (A) having a density of 950 to 968 kg/m<sup>3</sup> in an amount of 40 to 80 wt%; and
- b) a low density polyethylene homopolymer (B) in an amount of 20 to 60 wt%, wherein the polymer composition has a melt flow rate under a load of 2.16 kg according to ISO 1133, at 190°C (MFR<sub>2</sub>), of 5 to 20 g/10min.

Claim 2 (Canceled).

Claim 3 (Currently Amended): A composition according to claim [[2]] 1 characterized in that the composition has a density, according to ISO 1183-1987, of 930 to 950 kg/m<sup>3</sup>.

Claim 4 (Previously Presented): A composition according to claim 1 characterized in that the polyethylene (A) has a density, according to ISO 1183-1987, of 950 to 965 kg/m<sup>3</sup>.

Claim 5 (Previously Presented): A composition according to claim 1 characterized in that the polyethylene (A) has a melt flow rate MFR<sub>2</sub>, according to ISO 1133, at 190 °C, of 5 to 20 g/10 min.

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Claim 6 (Previously Presented): A composition according to claim 1 characterized in that the polyethylene (A) has a weight average molecular weight  $M_w$  of 50000 to 150000 g/mol.

Claim 7 (Previously Presented): A composition according to claim 1 characterized in that the polyethylene (A) is bimodal.

Claim 8 (Previously Presented): A composition according to claim 1 characterized in that the polyethylene (A) comprises ethylene homopolymer and/or ethylene copolymer.

Claim 9 (Previously Presented): A composition according to claim 8 characterized in that the ethylene copolymer comprises ethylene and at least one  $C_3$  to  $C_{20}$   $\alpha$ -olefin.

Claim 10 (Previously Presented): A composition according to claim 1 characterized in that the comonomer content in the polyethylene (A) is 0.1 to 1.0 % by mole.

Claim 11 (Previously Presented): A composition according to claim 1 characterized in that the polyethylene (A) comprises a low molecular weight fraction (LMW) and a high molecular weight fraction (HMW).

Claim 12 (Original): A composition according to claim 11 characterized in that the polyethylene (A) comprises 40 to 60 % by weight of the low molecular weight fraction (LMW).

Claim 13 (Previously Presented): A composition according to claim 11 characterized in that the low molecular weight fraction (LMW) is a homopolymer.

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Claim 14 (Previously Presented): A composition according to claim 11 characterized in that the comonomer content is lower than 0.2 % by mole in the low molecular weight fraction (LMW).

Claim 15 (Previously Presented): A composition according to claim 11 characterized in that the low molecular weight fraction (LMW) has a density, according to ISO 1183-1987, of at least 973 kg/m<sup>3</sup>.

Claim 16 (Previously Presented): A composition according to claim 11 characterized in that the low molecular weight fraction (LMW) has a melt flow rate MFR<sub>2</sub>, according to ISO 1133, at 190°C, of 100 to 2000 g/10 min.

Claim 17 (Previously Presented): A composition according to claim 11 characterized in that the low molecular weight fraction (LMW) has a weight average molecular weight Mw of 10000 to 60000 g/mol.

Claim 18 (Previously Presented): A composition according to claim 11 characterized in that the high molecular weight fraction (HMW) is an ethylene copolymer.

Claim 19 (Previously Presented): A composition according to claim 18 characterized in that the ethylene copolymer comprises ethylene and at least one C<sub>3</sub> to C<sub>20</sub> α-olefin.

Claim 20 (Previously Presented): A composition according to claim 18 characterized in that the comonomer content in the high molecular weight fraction (HMW) is 0.2 to 2.0 % by mole.

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Claim 21 (Previously Presented): A composition according to claim 18 characterized in that the high molecular weight fraction (HMW) has a weight average molecular weight Mw of 80000 to 300000 g/mol.

Claim 22 (Previously Presented): A composition according to claim 1 characterized in that the polyethylene (B) is long chain branched.

Claim 23 (Previously Presented): A composition according to claim 1 characterized in that the polyethylene (B) has a density, according to ISO 1183-1987, of 910 to 935 kg/m<sup>3</sup>.

Claim 24 (Previously Presented): A composition according to claim 1 characterized in that the polyethylene (B) has a melt flow rate MFR<sub>2</sub>, according to ISO 1133, at 190°C, of 3 to 15 g/10 min.

Claims 25-26 (Canceled).

Claim 27 (Previously Presented): A composition according to claim 1 characterized in that the composition comprises 40 to 70 % by weight polyethylene (A) and 30 to 60 % by weight polyethylene (B).

Claim 28 (Previously Presented): A composition according to claim 1 characterized in that the composition comprises additionally  
c) other polymer(s) up to 20 % by weight.

Claim 29 (Previously Presented): A composition according to claim 1 characterized in that the composition comprises additionally  
d) antioxidant(s) and/or process stabilizers of less than 2000 ppm.

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Claim 30 (Previously Presented): A coating having a coating weight of 20 g/m<sup>2</sup> made of the composition according to claim wherein the coating has a vapor transmission rate (WVTR), according to ASTM E96, of less than 15.5 g/m<sup>2</sup>/24h.

Claim 31 (Previously Presented): A multi-layer material comprising

- a) a substrate as a first layer
- b) a polymer composition according to claim 1 as at least a further layer.

Claim 32 (Original): A multi-layer material according to claim 31 characterized in that the substrate is selected from the group consisting of paper, paperboard, aluminum film and plastic film.

Claim 33 (Withdrawn): A process for producing a composition according to claim 1 characterized in that

- a) the polyethylene (A) is produced in a multistage process comprising a loop reactor and a gas phase reactor, wherein the low molecular weight fraction is generated in at least one loop reactor and the high molecular weight fraction is generated in a gas phase reactor;
- b) the polyethylene (B) is produced by a free radical polymerization in a high pressure autoclave process; and
- c) polyethylene (A) and polyethylene (B) are blended together and compounded by using an extruder.

Claim 34 (Withdrawn): A process according to claim 33 characterized in that the catalyst used for the process producing the polyethylene (A) is a high activity procatalyst comprising a particulate inorganic support, a chlorine compound deposited on the support, wherein the chlorine compound is the same as or different from the titanium compound, the procatalyst being formed by steps comprising:

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contacting the inorganic support with an alkyl metal chloride which is soluble in non-polar hydrocarbon solvents, and has the formula  $(RnMeC_{3-n})_m$  wherein R is a C<sub>1</sub> to C<sub>20</sub> alkyl group, Me is a metal of group III (13) of the periodic table, n = 1 or 2 and m = 1 or 2, to give a first reaction product,

contacting the first reaction product with a compound containing hydrocarbyl and hydrocarbyl oxide linked to magnesium which is soluble in non-polar hydrocarbon solvents, to give a second reaction product, and

contacting the second reaction product with a titanium compound which contains chlorine, having the formula  $Cl_xTi(OR^{IV})_{4-x}$ , wherein R<sup>IV</sup> is a C<sub>2</sub> to C<sub>20</sub> hydrocarbyl group and x is 3 or 4, to give the pro-catalyst.

Claim 35 (Withdrawn): A process for producing a multi-layer material according to claim 31 characterized in that polymer composition according to claim 1 is applied on the substrate by a film coating line comprising an unwind roll, a wind roll, a chill roll and a coating die.

Claim 36 (Previously Presented): An extrusion coating comprising the polymer composition according to claim 1.

Claim 37 (Previously Presented): A multi layer material comprising the extrusion coating according to claim 36.